

Remarks

The Rejection of Claims 1, 15 and 28 (the independent claims) based on Sakamoto (US Patent 5,594,463).

The Office Action rejected the independent claims 1, 15 and 28 under 35 U.S.C. §103 (a) as being unpatentable over Sakamoto. Reconsideration is requested.

Starting with claim 1; a method is described in this claim for optimizing lifetime of an OLED display element, the OLED display element comprising

- a plurality of addressable discrete OLED pixels,
- each of said OLED pixels being driven by a supply voltage and a drive current provided by a current driver,
- each OLED pixel having a threshold voltage,

the method comprising, for an OLED pixel:

- a. determining an environmental parameter which affects aging of an OLED pixel,
- b. determining a first operational parameter indicative of aging of the OLED pixel, and
- c. compensating at least partly for aging by changing a second operating parameter of the OLED pixel based on the determination of the environmental parameter and the first operational parameter.

According to feature c) above, compensation is done by changing a second operating parameter of the OLED pixel. This change of one single parameter is based on a double measurement: the determination of a environmental parameter of the OLED pixel and the determination of a first operational parameter of the OLED pixel. In other words: the method according to claim 1 provides a one step control, based on two measurements.

The device/apparatus shown in Sakamoto differs from the method described in claim 1 in the following way:

1. The display in the Sakamoto uses EL elements instead of OLED's and it is not clear if the elements in '463 have a threshold voltage;
2. In Sakamoto a control in two consecutive steps of an EL display is disclosed, each step consisting in a regulation of a parameter based on the measurement of another parameter.

Two examples are given of such two-step control. In the first example:

- 1st step: the temperature T_p of the display panel is measured and, if T_p exceeds a certain limit, the driving current value is decreased;

- 2nd step: from a calculated voltage drop V_f of the EL element, a driving voltage V_d is estimated and set (col. 7, line 64 – to col. 8, line 14 and Fig. 8).

The second example is very analogous to the first one, the only difference being that in the 2nd step, from the calculated voltage drop a driving current I_f , is estimated and set (col. 10, lines 22 – 45 and Fig. 12).

Since Sakamoto discloses a control of an EL display in two consecutive steps and not a control in one single step, the subject-matter of original claim 1 is not anticipated by Sakamoto, indeed the rejection is not on this basis.

Numao discloses a method for estimating the temperature of an organic EL element by using a temperature measuring circuit.

Ochi et. al., discloses an EL device driving apparatus, capable of keeping the light emission characteristics constant even if the environmental temperature fluctuates. The apparatus includes a temperature sensing unit for sensing an operation temperature and a temperature compensating unit for changing the light emission driving energy in accordance with the operation temperature.

Suzuki, discloses a method for precharging current-driven display elements, disposed in a matrix fashion.

Mazurek et.al., discloses a tiled modular display system, including an array of display modules which contain thin seal liquid crystal displays (LCD's). In order to maintain the maximum possible uniform luminance output, the system includes a patterned diffuser which is shaded in a manner such that the diffuser's luminance output is equal in value to the lowest detected luminance output in the array (col. 14, lines 13-19).

Hanaki et.al., discloses a method for equalizing variations in luminance among the EL elements of an electroluminescent display device. According to this method, a dummy voltage promoting degradation is applied to the non-driven elements while the drive voltage, applied to a driven element, is modified, depending on the degree of degradation of that element.

The degree of degradation is determined based on an accumulated drive period, the number of

drives or the like.

The one step compensation of aging of an OLED-pixel by changing an operational parameter of that pixel, whereby the change is based on two other parameters, an environmental one and an operational one, not being disclosed in anyone of the cited prior art references, the subject-matter of claim 1 clearly is not anticipated by any of the cited prior art references.

The same reasoning can be applied for the other independent claims 15 and 28.

Moreover, the two consecutive steps control, as disclosed in Sakamoto, can lead to negative effects. Because it cannot be excluded that as result of the first step, the driving current is decreased (Fig. 12, S126) while the second step asks for an increase of the driving current (S156). Under such circumstances, the system would start oscillating between two stable situations, which is clearly undesirable.

By bringing together the compensation for aging in one single step as described in claim 1, such effect is eliminated and the method of claim 1 solves a technical problem present in the prior art. The bringing together of the compensation for aging based on the measurement of two different measurements in one single step is not disclosed in or suggested by in any of the prior art references.

Consequently, the subject-matter of claim 1 is not only novel but also non-obvious. Thus, the subject matter of claim is submitted to be patentable. The same arguments apply to the subject-matter of the other independent claims 15 and 28.

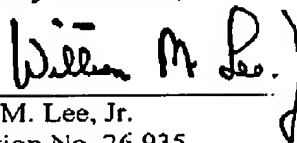
The Rejection of the other Claims (the dependent claims) on Sakamoto (US Patent 5,594,463) in combination with one of the other cited references. The Office Action rejected all the dependent claims under 35 U.S.C. 103 (a) as being unpatentable over Sakamoto alone or in combination with one of the other cited references. Reconsideration is also requested.

All other claims are dependent claims, and are submitted to be allowable as the independent claims are allowable.

Given the above, it is submitted that the application is now in condition for allowance, and the Examiner's further and favorable reconsideration is urged.

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Respectfully submitted,



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